

Topworking Mature *Pinus edulis* Trees with *Pinus monophylla*

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Abstract

Pine nuts are commonly collected from native stands of single-leaf pinyon pine (*Pinus monophylla*) throughout the Great Basin. The goal of this research was to test the feasibility of topworking wild pinyon pines (*Pinus edulis*) to improve pine nut production.

During 2017, both spring and fall season grafting was attempted. For spring grafting, scion wood of *P. monophylla* was collected near Austin, Nevada on March 7 and grafted to mature, wild-grown *P. edulis* trees in Kaysville, Utah on April 19. For fall grafting, scion wood was collected near Eureka, Utah on August 23 and grafted to additional Kaysville rootstocks between August 25 and August 28.

These trials compared different scion accessions, scion types, and graft type. Scions were prepared as buds only (B) or buds with needles (BN). The B treatment involved removing all needles from the scion wood and dipping the bud in wax (April) or latex grafting sealant (August) to prevent desiccation. Grafts were tied with 5-inch × 3/8-inch grafting rubbers, wrapped with Parafilm[®], and coated with latex grafting sealant (Doc

Farwell[®] grafting seal). The BN treatment involved tying with grafting rubbers and then enclosing the completed graft in a 1-mil clear plastic sleeve to prevent desiccation. Also, one layer of 1.5-mil, opaque, white plastic tied with twist ties (April) or 6-mil white plastic was tented over the graft and stapled (August) to reduce heat.

Graft types included bark, side-wedge, and side-stub grafts. Bark grafts were performed by cutting off the end of a rootstock branch and slicing the bark with a vertical cut about 1 inch in length down from the cut end. A sloping cut of similar length was made on one side of the B scions which were then slid inside the bark with the cut surface against the wood. Side-wedge grafts were completed on 1- to 2-year-old rootstock wood. The scions (B and BN) were cut into a V-shape about ½ to 1 inch long. A corresponding cut was made at a downward angle into the rootstock about one-third the width of the stem. Side-stub grafts consisted of BN scions and were almost identical to side-wedge grafts, with the exception that the graft was performed on the main trunk of the tree rather than on newer wood. Three scion accessions were

randomly applied to each rootstock tree. For each scion accession, the four graft types were completed, resulting in 120 grafts in April and 108 grafts in August. When evaluated on May 18, 2018, the main effects of scion treatment and season were statistically significant, showing greater success with BN scions (43% as compared to 12% with B) and spring grafting (27% as compared to 6% with fall). Bark grafts were the least successful of all the graft types, with only 1 surviving among the April grafts (0.8%) and none surviving among the August grafts. The BN side-wedge grafts were the most successful among the April grafts (16%) and the BN side-stub grafts were the only successful grafts among the August grafts (6%).

The experiment was repeated on April 18, 2018, using 10 *P. edulis* stock trees at the Blue Creek Experimental Farm with scion wood collected from 3 trees near Eureka, Utah, on March 5. Scions were handled as in the BN treatment, and 6-mil white plastic was tented and stapled over the graft. Graft types were side-wedge and side-veneer grafts. Side-veneer grafts consisted of scion wood

cut shallowly along one side and notched at the bottom. A corresponding shallow cut was made in the rootstock and the scion set into the rootstock with cut sides facing each other. Grafts were tied with grafting rubbers as above and wrapped with Parafilm®.

For each rootstock tree, 3 scion accessions were used. For each accession, one side-wedge and one side-veneer graft were completed, resulting in 6 grafts per rootstock and 60 grafts total. After four weeks, the plastic covers were slit and then removed 1 week later. Grafts were evaluated after 10 weeks (June 29). Assessment of the grafts showed 78% with elongated candles, 8% alive but not growing, and 13% dead. Grafting success for side-wedge grafts and side-veneer grafts was 82% and 83%, respectively, with no significant difference. The average scion growth of accession #1 (1.1 cm) was significantly less than that of scions #2 or #3 (2.8 and 2.3 cm, respectively). These preliminary studies indicate that wild *P. monophylla* scions can be established in the canopy of uncultivated *P. edulis* trees.